Technical Data Sheet

SYLGARD™ 1-4128 Conformal Coating

Lower-viscosity, lower-temperature, faster-curing, heat-cure, transparent coating. Two-part version of SYLGARD™ 1-4105 Conformal Coating for applications requiring longer storage or shipping time.

Features & Benefits

- Low viscosity
- Heat cure
- Cures to soft, low stress elastomer
- No added solvents
- UV indicator for inspection
- Rapid, versatile cure processing controlled by temperature
- Good adhesion allows use with many low-solids (no clean) and no-lead solders
- Low viscosity enhances flow and fill in narrow gaps and spaces
- UV indicator allows for automated inspection

Applications

- Protective coating for rigid and flexible circuit boards
- Printed wiring board (PWB) applications sensitive components and fine pitch designs

Application Methods

- Applied by dip, spray, brush, flow or automated pattern coating
- Stable bath life makes it ideal for dip coating applications

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Viscosity (Mixed)	cP	475
	mPa-sec	475
	Pa-sec	0.5
Tack Free Time @ 105°C	min	3
Cure Time @ 105°C	min	5
Durometer Shore 00		64
Shelf Life @ 32°C	months	24

Form No. 11-1774-01-1022 S2D

Description

A two-part, solvent-free medium viscosity heat curable silicone for moderate to high production throughput with fast, low temperature heat cure. Excellent adhesion to most low-solids (no-clean) and no-lead solder flux residues. Provides a flexible moisture barrier and excellent stress-relieving protective coating. Solventless heat cure conformal coatings are designed for rapid processing at low temps (below 125°C). They require some heating to cure, offering long bath at room temperature. Like the room temperature-curing elastomers, these products offer optimum stress relief to surface mount and fine pitch components and interconnections in a variety of service environments. This product line also features coatings that are Mil Spec, IPC-CC-830 and UL recognized. Conformal coatings are materials applied in thin layers (typically a few mils or microns) onto printed circuits or other electronic substrates. They provide proven, cost effective environmental and mechanical protection to significantly extend the life of the components and circuitry. Underwriters Laboratory (UL) 746E recognition is based on thickness and substrate requirements. Please consult the UL Online Certifications Directory for the most accurate certification information.

Processing/Curing

Time to cure is dependent on film thickness, type of oven, and board population density. Heat cure time in the Typical Properties table gives an indication of typical times after the coating is heated to the temperature indicated. Highly populated, large, heavy boards may take longer than the indicated times due to the large thermal mass taking extra time to warm.

Pot Life and Cure Rate

The pot life of Dow heat cure conformal coatings is also dependent on the conditions in which they are processed, but is typically greater than 2 months. Dip tanks or containers should be closed and sealed when not in use. To maximize pot life, tank temperatures should be maintained at less than 29°C (85°F).

Adhesion

With heat cure coatings, the adhesion is complete with the full cure time and temperature. Dow conformal coatings are formulated to provide adhesion to most common electronic substrates and materials. On certain difficult, low-surface energy surfaces, adhesion may be improved by priming or by special surface treatment such as chemical or plasma etching.

Compatibility

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include: organotin and other organometallic compounds, silicone rubber containing organotin catalyst, sulfur, polysulfides, polysulfones or other sulfur containing materials, unsaturated hydrocarbon plasticizers, and some solder flux residues. If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a simple small scale compatibility test be run to ascertain suitability in a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

Useful Temperature Ranges

For most uses, silicone elastomers should be operational over a temperature range of -45 to 200°C (-49 to 392°F) for long periods of time. However, at both the low- and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations. For low-temperature performance, thermal cycling to conditions such as -55°C (-67°F) may be possible, but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. At the high-temperature end, the durability of the cured silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

Repairability

In the manufacture of electronic devices, it is often desirable to salvage or reclaim damaged or defective units. Dow conformal coatings offer excellent repairability because they can be removed from substrates and circuitry by scraping or cutting, or by using solvents or stripping agents. If only one circuit component is to be replaced, a soldering iron may be applied directly through the coating to remove the component. After the circuit board has been repaired, the area should be cleaned by brushing or by using solvent, then dried and recoated. Heat cure coatings can be repaired with RTV coatings, but heat cure coatings may not work well when used to repair RTV coatings.

Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

Shelf life is indicated by the “Use Before” date found on the product label.

Packaging Information

In general, Dow conformal coatings are supplied in nominal 0.45, 3.6, 18 and 200 kg (1, 8, 40 and 440 lb) containers, net weight. Not all coatings may be available in all packages and some additional packages, such as bladder packs or tubes, may be available for certain coatings and package sizes.

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Health and Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com or consult your local Dow representative.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user’s responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

How Can We Help You Today?

Tell us about your performance, design, and manufacturing challenges. Let us put our silicon-based materials experience, application knowledge, and processing experience to work for you.

For more information about our materials and capabilities, visit **dow.com**.

To discuss how we could work together to address your specific needs, go to **dow.com** for a contact close to your location. Dow has customer service teams, science and technology centers, application support teams, sales offices, and manufacturing sites around the globe.

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